

Water management in Ontario

Ontario
Water Resources
Commission

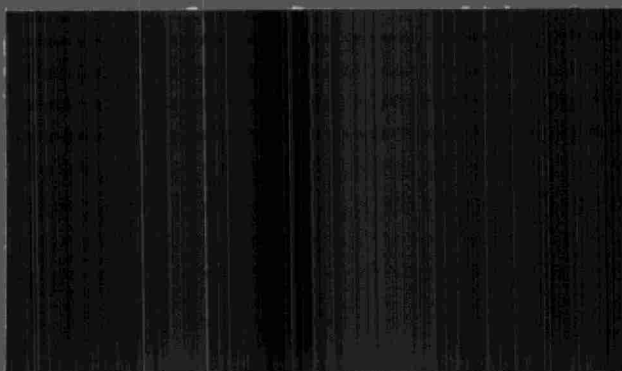
Great Lakes
Water Quality
Surveys Program

GREAT LAKES
W.Q. LIS

STANDARDS DEVELOPMENT BRANCH OMOE



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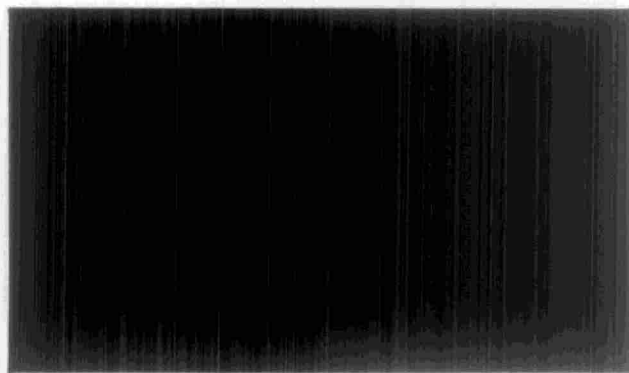
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Great Lakes deck sheet coding
manual. Vanderkooy, N.
80626

GREAT LAKES
DECK SHEET CODING
MANUAL
JANUARY 1970

Prepared by

N. Vanderkooy
Water Quality Surveys Branch
Division of Sanitary Engineering.

INDEX

	<u>PAGE</u>
Introduction	1
Points to know	1
CARD 1	
- Information Common to a Sampling Station	3
CARD 2	
- Request for Onshore analysis	7
CARD 3	
- Results of Onboard analysis	9
Computer Codes for Deck Sheets	APPENDIX A
Deck Sheet	APPENDIX B
Sample problems	APPENDIX C
Parameter Test Codes	APPENDIX D

GREAT LAKES DECK SHEET CODING MANUAL

INTRODUCTION

The format of the deck sheet was designed to facilitate transfer of information to punch cards. The cards are then keypunched and comprise the input to the Great Lakes computer system.

Suggestions will be made under the following sections to ensure that all input data is accurate.

A completed deck sheet and appropriate codes have been appended for ready reference. (Appendix B)

POINTS TO KNOW

1. The numerals in small print under the square on the deck sheet indicate the card column (cc) on the IBM card in which the written information will be key-punched.
2. The blocks of squares, e.g. Barm Pres., Water Depth, etc., have a specified extent, i.e. barometric pressure has 3 squares identified as cc 58, 59, 60. More digits in any one block than there are attached cannot be accepted by the computer system.
3. Insert figures as carefully as possible so that they be clearly legible and not suggest ambiguity.

4. Ensure that the required data is inserted in the appropriate block.

5. When zeros are required, fill them in. Do not leave square empty when you want to indicate an actual value of zero.

When a block of squares is left blank, this will be interpreted to mean that the test or observation was not performed.

6. Fill out only one original copy of the deck sheet. To facilitate the photocopying of these deck sheets when they are forwarded to the laboratory, all entries should be made in black ink.

There are three sections or card types on the deck sheets for which information is to be recorded:

Card 1 - Information common to a sampling station.

Card 2 - Requests for on-shore analysis.

Card 3 - Results of on-board analysis.

For every sample number used, a 3 card must be submitted.

Each card type, on the deck sheet can be identified by a corresponding number in box above cc 1 of

each section. For each section an IBM card or cards will be keypunched in order to record and retain the written information. These cards will then be identified by Type as either Card 1, Card 2 or Card 3.

CARD 1 INFORMATION COMMON TO A SAMPLING STATION

cc 2-11 Sample Numbers

- Insert the sample number assigned to the first sample taken, into cc 2-6.
- Insert the sample number assigned to the last sample taken, into cc 7-11.
- Note: A sample number MUST be entered in each block. The sample number in cc 7-11 may be the same as that in cc 2-6 when only one sample was collected for that visit.

cc 12-13 Project

- Insert proper figure from cruise plan.
- Note: Each survey will be assigned a two digit code by the office. This field MUST be used.

cc 14 Agency

- Preprinted

cc 15-16 Study

- Preprinted

cc 18-19 Body of Water (BOW)

- Refer to Appendix A or cruise schedule and insert applicable code.

cc 20-21 Station Type

- Refer to Appendix A or cruise schedule and insert applicable code.

cc 25-29 Distance from Reference Point

- Insert the measured distance in feet from the reference.
- Note: In all cases, other than lake stations (type, 01), the distance from reference point must be recorded on the deck sheet.
- The reference point for stream stations (type 02) is taken as the right shore looking down stream.
- The reference point for outfalls or intakes is taken as the point of discharge or withdrawal of the water. If it is collected prior to initial dilution (inside the pipe) the distance from reference point is recorded as "zero" feet. In addition, samples collected other than 0 feet from from reference point, "bearing from reference point" (cc 77, 78 and 79) should be recorded.
- Distance from reference point may be used for lake station if you require to tie a non existing sampling location with an existing station.

cc 30-33 Water Depth - Meters

- Insert a figure in meters for the water depth at the station measured to the nearest tenth, from the surface to the bottom.
- Note: There is an inferred decimal between cc 32 and cc 33.

cc 34-39 Date of Samples

- Record in the order shown above the boxes on the deck sheet.

Note: Ensure that the calendar date given coincides with Greenwich Mean Time.

cc 40-43 Sampling Time G.M.T.

- Record the time in hours and minutes based on a 24-hour system that the actual collection of data occurred at the station. Greenwich Mean Time must be used.

Note: Eastern Standard Time plus 5 hours equals Greenwich Mean Time.
Daylight Saving Time plus 4 hours equals Greenwich Mean Time.

cc 48-49 Weather

- Refer to Appendix A and insert applicable codes.

Note: Both columns should be marked except in the case of a "clear condition" when cc 49 must be left blank.

cc 50-51 Wind Force-Knots

- Insert the figure in knots for measured wind force.

cc 52-54 Wind Direction - Degrees North

- Wind direction is measured in degrees in a clockwise direction from north.
- A north wind is defined as blowing from the north and its direction is recorded as 360°.

Note: Insert 500 in cc 52-54 if the wind is variable.

- This block must be blank if wind force is 00.

cc 55-57 Air Temperature °C

- Insert the figure in degrees centigrade measured to the nearest tenth.

Note: There is an inferred decimal between cc 56 and cc 57.

- For temperatures below zero, add 50 to the measured value, e.g. - 5°C is recorded as 55.0°C.

cc 58-60 Barometric Pressure

- Insert the figure in millibars for the measured barometric pressure.

Note: If barometric exceeds 1000 millibars record only last 3 digits.

cc 62-65 Station Number

- Insert the station number which corresponds to the sampling location from the chart and the cruise plan.

Note: If station number is not available, plot the location on the relevant hydrographic chart and submit the chart with the deck sheets to the office. A station number will be assigned to the location and submitted to EDP.

cc 70-72 Secchi Disc Meter

- Insert the figure in meters measured to the nearest tenth.

- There is an inferred decimal between cc 71 and cc 72.

cc 73-74 Secchi Disc Colour

- Refer to Appendix A for corresponding colour code which best describes the colour of the water reflected on the disc.

Note: If a single numeral applies to the colour then the code should be repeated in cc 74. e.g. Green will be indicated by 55 in cc 73 and 74.

cc 77-79 Bearing from Reference Point

- This block is used together with distance from reference point (cc 25-29) when a sample is collected from an outfall or intake.
- The bearing is measured at the sampling location from the outfall or intake in degrees from North where North is 360°.
- The reading is measured to the nearest 5 degrees.
- Bearing from Reference point should be used when a sample is collected from an outfall or intake other than zero feet from reference point.

CARD 2 REQUEST FOR ON-SHORE ANALYSIS

cc 2-6 Sample Number

- Insert one sample number from the range of numbers on Card 1 cc 2-11, into one of the available blocks in Card 2, when onshore analysis is requested for that particular sample.

Note: If more than six sample numbers are used for any one visit, a second deck sheet will be required. The second deck sheet will have a unique set of sample numbers than those

reported on the first deck sheet, while the additional information on the 2nd deck sheet must be identical to that reported on Card 1 of the original sheet.

IMPORTANT.

Seperate sample number should be assigned to the following types of samples:

- When grab sample is collected.
- When Phyto Plankton and/or Chlorophyll sample is collected.
- When Zoo Plankton sample is collected.
- When Benthic sample is collected.
- When bottom grab sample is collected.
- When core sample is collected.
- When B. T. slide is taken.

Note: For every sample number used a card 3 must be submitted.

cc 7-9 Test Requested

- Check the box under the type of test required, check all three boxes if all are required.

cc 10 Chemical A

- Check cc 10 only if all tests in cc 11-18 are required.

Note: If specific parameters are required cc 10 should be blank and individual columns from cc 11-18 should be checked.

cc 19-20 Blank

- Do not use under any circumstances.

cc 21-37 Tests Requests

- Check the box under the particular test required.

cc 38-61 Additional Test Requests

- Refer to Appendix D for the appropriate test code and enter it into the first empty digit block beginning at cc 38, 39 and 40. One 3 digit block is used for each parameter.

Note: The name of the parameter should be written inside the block and the 3 digit test code must be entered in the appropriate squares for keypunching.

IMPORTANT:

- Procedures for reporting biological samples refer Appendic C examples 3 to 5.
- A card 3 must be submitted for all sample numbers used on card 2.

CARD 3 RESULTS OF ONBOARD ANALYSIS

cc 2-6 Sample Number

- Insert one sample number for each sample taken against which the corresponding results of onboard analysis will be recorded.

cc 7-10 Sample Depth-Meter

- Insert the figure in meters for the vertical depth at which the sample was taken to the nearest tenth of a meter.

Note: There is an inferred decimal between cc 9 and cc 10. Be sure that the figure recorded is shown against the relevant laboratory number.

- When collecting a sediment grab sample add .1 to the water depth (card 1, cc 30-33) and record in cc 7 to 10 on card 3.

cc 11-13 Field Conductivity

- Micro Mhos/square centimeter insert measured value.

IMPORTANT:

- When conductivity value is greater than 3 digits, insert test code 802 (field conductivity) on card 2 for additional parameters and submit correct value on a separate benchsheet.
- If a benchsheet is not available, record the conductivity value under REMARKS and insert test code 802 on card 2 for additional parameters, and the office will submit the benchsheet to EDP.

cc 14-16 Water Temperature °C

- Insert the temperature value of sample collected in degrees centigrade to the nearest tenth of a degree.

Note: There is an inferred decimal between cc 15 and 16.

- When temperature is measured to two decimal places, the value should be rounded to the nearest tenth.

cc 17-20 Dissolved Oxygen - ppm

- Insert the value in parts per million for the concentration of dissolved oxygen in the sample collected.

Note: There is an inferred decimal between
cc 18-19.

cc 21-24 pH-Standard Units (S.U.)

- Insert the value for the pH of the sample.

Note: There is an inferred decimal between cc
22-23.

cc 25-27 Alkalinity - CaCO₃ ppm

- Insert value measured for Alkalinity of the
sample collected.

cc 28-30 Current - Direction Degrees North

- Insert value for current direction measured
in degrees from north in a clockwise direc-
tion.

Note: A northerly current defined as flowing
towards the north and its direction is re-
corded as 360°.

cc 31-34 Current-Velocity cm/sec

- Insert the value in centimeters per second
for the measured current velocity.

Note: A conversion factor has been provided
in Appendix A if the velocity is measured
in feet per second.

cc 36 BT. Taken

- Insert check mark when B.T. slide was taken.

Note: For each B.T. slide collected the following
information is required:

- Assign sample number

cc 2-6

- Enter initial depth 0.0 cc 7-10
- Enter depth composite code 12 cc 72-73
- Enter total depth of station cc 74-77
- Indicate continuous sample
code 99 cc 78-79

IMPORTANT

- Record sample number and date of collection on the slide.

cc 72-73 Sample Type

- Refer to Appendix A for appropriate code.

Note: An entry must be made for all samples collected other than water grab sample (sample type 11).

cc 74-77 Interval-Composite Sample

- Insert total depth in meters or time in hours for depth or time composite samples respectively.

Note: There is an inferred decimal between cc 76 and cc 77.

- In case of depth composite sample the interval is measured between the initial depth and final depth to the nearest tenth. Similarly in case of time composite samples the interval is measured between the initial time and the final time to the nearest tenth. (see samples 1 & 2 in Appendix C).

cc 78-79 Number of Samples

- Insert number of samples collected over the interval depth or interval time for a composite sample.

Note:

- Code 99 in cc 78-79 is recorded if a continuous sampling technique such as a pump or B.T. slide, is used for a composite sample.

NV/jf

APPENDIX A

COMPUTER CODES FOR DECKSHEETS

APPENDIX A (Cont'd)

BODY OF WATER

Code in Cols 18-19 - Card 1

<u>B.O.W.</u>	<u>CODE</u>	<u>B.O.W.</u>	<u>CODE.</u>
Lake Superior	01	Lower Niag R.	11
Georgian Bay	03	St. Lawrence R.	12
Lake St. Clair	04	St. Marys R.	13
Upper Niag R.	05	North Channel	14
Lake Ontario	06	St. Clair R.	15
Whitefish Bay	07	Lake Erie	16
Lake Huron	08	Bay of Quinte	17
Hamilton Bay	09		
Detroit River	10		

STATION TYPE

cc 20, 21 - Card 1

	<u>CODE</u>
Lake	01
Stream	02
Outfall - Mun. Sanitary Treated	03
- Mun. Sanitary Raw	04
- Mun. Storm	05
- Mun. Combined Treated	06
- Mun. Combined Raw	07
- Mun. Relief	08

APPENDIX A (Cont'd)

STATION TYPE CONT.

Outfall - Ind. Process	09
- Cooling	10
- Ind. Storm	11
- Ind. Sanitary	12
Outfall - Pri. Sanitary Treated	13
- Pri. Sanitary Raw	14
Tributary Stream	15
Landfill Project	16
Harbour Station (Kingston Harbour)	17
Intake - Municipal Water	20
- Industrial Water	21
- Private Water	22

WEATHER - CARD 1

<u>WEATHER</u>	<u>CODE cc 48</u>	<u>WEATHER</u>	<u>CODE cc 49</u>
Clear	1	Light	1
Rain	2	Medium	2
Hail	3	Heavy	3
Snow	4		
Cloud	5		

APPENDIX A (CONT'D)

SECCHI DISC COLOUR cc 73-74 - Card 1

<u>COLOUR</u>	<u>CODE</u>	<u>COLOUR</u>	<u>CODE</u>
Black	0	Green	5
Red	1	Blue	6
Brown	2	Violet	7
Orange	3	White	8
Yellow	4	Grey	9

SAMPLE TYPE

cc 72-73 Card 3

<u>Sample Composition</u>	<u>Code cc 72</u>	<u>Sampling Method</u>	<u>Code cc 73</u>
Whole water	1	Grab	1
Bottom deposit	4	Space composite	2
		Time composite	3

FACTORS

Feet x .30 = Meters
Ft/Sec x 30.5 = CM/SEC

MISCELLANEOUS

Current Direction
on Card 3

- the value reported is measured to degrees from north in the direction to which the water flows.

Wind Direction
on Card 1

- the value reported is measured in degrees from north in the direction from which the wind blows.

APPENDIX B

DECK SHEET

[illegible]

CD		SAMPLE NO.					SAMPLE DEPTH METER				FIELD COND. μMHOS/CM ² 25°C			WATER TEMP °C			D.O. (ppm)				pH (SU)			ALKALINITY CaCO ₃ (ppm)			CURRENT DIRECT DEG N			VELOCITY CM/SEC				BT TAKEN	SAMPLE TYPE		INTERVAL (METERS - HOURS)				NO. OF SAMPLES		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	36	72	73	74	75	76	77	78	79	
3	1	0	1	0	0	2	5	3					1	1		1	4	2		7	9			9	8																		
3	1	0	1	0	1	1	5						.			.				.																1	2		8	5		0	2
3	1	0	1	0	2	5	0	7					.			.				.																4	1		.				
3	1	0	1	0	3	5	0	7					.			.				.																4	1		.				
3	1	0	1	0	4	5	0	6					.			.				.																4	2		0	3		9	9
3	1	0	1	0	5	0	0						.			.				.															✓	1	2		5	0	6	9	9

ENTERED BY

CHART DESCRIPTION

CHECKED BY

DATE _____

REMARKS

APPENDIX C

SAMPLE PROBLEMS

APPENDIX C

EXAMPLES

1) Depth Composite Sample

A sample collected at a certain location comprises of 5 samples collected between 0.0 meters and 50.0 meters.

Enter 0.0 in cc 7-10 as start depth.

Enter 12 in cc 73 as sample type.

Enter 50.0 in cc 74-77 as interval between initial depth and final depth sampled.

Enter 5 in cc 78-79 as number of samples collected of the 50 meters.

2) Time Composite Sample

A time composite sample collected at a predetermined location consists of 4 samples collected between 11.00 G.M.T. and 15.00 G.M.T.

Enter 11.00 in cc 40-43 card 1, indicate initial time for sampling period.

Enter 13 in cc 73 Indicate sample type (time composite).

Enter 4.0 in cc 74-77 Indicate time interval between first and last sample collected.

Enter 4 in cc 78-79 Indicate number of samples collected during the interval time period.

APPENDIX C (Cont'd)

3) Phytoplankton and Chlorophyll ABC Samples

A Phytoplankton and a Chlorophyll sample was collected at certain locations comprised of a depth composite sampled at 1.5 and 10 meters.

Enter 1.5 in cc 7-10 Card 3 Indicate initial depth.

Enter 12 in cc 72-73 Card 3 Indicate sample type.

Enter 8.5 in cc 74-77 Card 3 Indicate depth interval between
initial depth (1.5M) and
final depth (10.0M).

Enter 0.2 in cc 78-79 Card 3 Indicate number of samples
collected.

NOTE: - If sampling location is too shallow for composite sample and only grab sample is collected, the sample depth is recorded on Card 3 opposite the appropriate sample number.

- For accepted sampling procedures see procedure manual.

4) Zoo Plankton Samples

When a zoo plankton is collected the following information is recorded:

Enter 0.0 in cc 7-10 Card 3 Indicate initial depth.

Enter 12 in cc 72-73 Card 3 Indicate sample type.

APPENDIX C (Cont'd)

Enter maximum depth of Card 3
sample in cc 74-77

Indicate depth interval/or
total depth in case of
shallow station.

Enter 9.9 in 78-79

Card 3

Indicate number of samples collected (99 denotes continuous sampling).

NOTE: For accepted sampling procedures see Procedures Manual.

5) Benthic Sample

When a Benthic sample is collected, the following information should be recorded on Card 3:

Enter sample depth in cc 7-10 on Card 3 by adding
0.1M to water depth recorded on Card 1.

Enter 41 in cc 72-73 to denote sediment grab sample.

6) Core Sample Taken

When core sample collected the following information should be recorded:

Enter test code 883 as an additional parameter on Card 2.

Enter total depth of station cc 7-10 Card 3 Indicate
initial depth for core sample.

Enter 42 cc 72-73 Card 3 Indicate depth composite.

Enter height of core sample cc 74-77 Card 3 indicate
interval or length of core sample.

Enter 99 cc 78-79 Card 3 Indicate continuous sample collected.

7) Grab Sediment

When grab sediment sample is taken the following infor-

APPENDIX C (Cont'd)

mation should be recorded.

Enter sample depth in cc 7-10 on Card 3 by adding 0.1M to water depth recorded on Card 1 opposite the assigned sample number.

Enter 41 in cc 72-73 to denote sediment grab sample.

APPENDIX D

PARAMETER TEST CODES

APPENDIX D

MEASUREMENT DATA ITEMS IN THE GREAT LAKES AUTOMATED SYSTEM

<u>TEST CODE</u>	<u>NAME</u>
001*	BIOCHEMICAL OXYGEN DEMAND
002	FILTERED BIOCHEMICAL OXYGEN DEMAND
003*	DISSOLVED OXYGEN PPM
004	SAMPLE TEMPERATURE (AT LAB)
005*	TOTAL SOLIDS
006*	SUSPENDED SOLIDS
007*	DISSOLVED SOLIDS
008*	TOTAL ASHED SOLIDS
009*	SUSPENDED ASHED SOLIDS
010*	DISSOLVED ASHED SOLIDS
011*	TOTAL LOSS IN IGNITION
012*	SUSPENDED LOSS ON IGNITION
013*	DISSOLVED LOSS ON IGNITION
014*	CONDUCTIVITY 25°C
015*	TURBIDITY
016*	TOTAL PHOSPHORUS AS PO ₄
017*	DISSOLVED PHOSPHORUS AS PO ₄
018	INSOLUBLE PHOSPHORUS
019*	FREE AMONIA
020*	TOTAL KJELDAHL
021*	NITRITE

<u>TEST CODE</u>	<u>NAME</u>
022*	NITRATE
023	ORGANIC NITROGEN
024*	PHENOLS (GIBBS)
027	TRANSPARENCY
028	REACTIVE PHOSPHATE
029	SOLUBLE PHOSPHATE (0.5 MICRO FILTER)
030*	PER CENT OXYGEN SATURATION (CALCULATED)
031	BOD RATE CONSTANT
032*	20 DAY BOD
033*	TOTAL PHOSPHORUS AS P
034*	DISSOLVED PHOSPHORUS AS P
040*	ANIONIC DETERGENTS
041*	CHEMICAL OXYGEN DEMAND
042	SETTLEABLE SOLIDS
043	VOLATILE ACIDS
045*	TOTAL CARBON AS CARBON
046*	INORGANIC CARBON AS CARBON
047*	ORGANIC CARBON AS CARBON
050*	HARDNESS PPM AS CaCO_3
051*	TOTAL ALKALINITY PPM AS CaCO_3
052	PHENOLPHTHALEIN ALKALINITY
053	TOTAL ACIDITY

<u>TEST CODE</u>	<u>NAME</u>
054	MINERAL ACIDITY
055*	PH AT LAB
056	REDOX POTENTIAL
057*	CHLORIDES
058*	SULPHATES
060*	FLUORIDE
061*	TOTAL IRON
062*	DISSOLVED IRON
063*	FERROUS IRON
064*	CALCIUM
065*	MAGNESIUM
066*	SODIUM
067*	POTASSIUM
068	APPARENT COLOUR UNITS
069	CHLORINE DEMAND
070	THRESHOLD ODOUR
071*	PH IN FIELD
072	RESIDUAL CHLORINE
073	ODOUR ON ARRIVAL
080*	TOTAL COLIFORMS
081*	FECAL COLIFORMS
082*	STANDARD PLATE COUNT (20 DEGREES C.)

<u>TEST CODE</u>	<u>NAME</u>
083	STANDARD PLATE COUNT (35 DEGREES C.)
084*	M.F. ENTEROCOCCI
085	M.P.N. COLIFORM
086	M.P.N. ENTEROCOCCI
087	FECAL COLIFORMS M.P.N.
200*	TOTAL MANGANESE
201	SOLUBLE MANGANESE
202	PERMANGANATE
203	TOTAL ALUMINUM
204	DISSOLVED ALUMINUM
206	TOTAL ANTIMONY
207	DISSOLVED ANTIMONY
209	TOTAL BARIUM
210	DISSOLVED BARIUM
212	BERYLLIUM
213	BISMUTH
214	BARON
215	CADMIUM
217	TOTAL COBALT
218	DISSOLVED COBALT
221*	TOTAL CHROMIUM
222	HEXAVALENT CHROMIUM

<u>TEST CODE</u>	<u>NAME</u>
223	DISSOLVED CHROMIUM
225	TOTAL COPPER
226	DISSOLVED COPPER
228	GOLD
229	TOTAL LEAD
230	DISSOLVED LEAD
231	ORGANIC LEAD
233	LITHIUM
234	TOTAL MERCURY
235	DISSOLVED MERCURY
236	MOLYBDENUM
238*	TOTAL NICKLE
239	DISSOLVED NICKLE
241	SILVER
242	STRONTIUM
243	TOTAL TIN
244	DISSOLVED TIN
245	TOTAL TITANIUM
246	DISSOLVED TITANIUM
247	URANIUM
248	VANADIUM
249*	TOTAL ZINC

<u>TEST CODE</u>	<u>NAME</u>
250	DISSOLVED ZINC
265*	TOTAL ARSENIC
266	DISSOLVED ARSENIC
271	TOTAL CYANIDE
272*	SIMPLE CYANIDE
273	CYANATE
274	THIOCYANATE
275	SELENIUM
276*	TOTAL SILICA
277	DISSOLVED SILICA
278	ACTIVE SILICA
280	TOTAL SULPHUR
281	COLLOIDIAL SULPHUR
282	ORGANIC SULPHUR
283	TOTAL SULPHIDE
284	DISSOLVED SULPHIDE
285*	SULPHITE
286*	IODINE NUMBER
287	IODINE DEMAND AS H ₂ S
288	PEARL - BENSON INDEX
290	CHLORINE DIOXIDE
291	BREAK-POINT CHLORINATION
295	TOTAL HALOGENS
296	BROMINE

<u>TEST CODE</u>	<u>NAME</u>
297	IODINE
301	TOTAL CARBON DIOXIDE
302	DISSOLVED CARBON DIOXIDE
303	FREE CARBON DIOXIDE
305	IRON AND ALUMINUM SALTS (OXIDES)
354	PETROLEUM HYDROCARBONS
361*	ETHER SOLUBLES
364	SAPONIFICATION NUMBER
367	PROTEIN NITROGEN
369	TOTAL REDUCING SUGARS
381*	LIGNIN + TANNINS
383	RESIN ACID SOAPS
401*	CHLOROPHYLL A
402*	CHLOROPHYLL B
403*	CHLOROPHYLL C
802*	FIELD CONDUCTIVITY
883*	CORE SAMPLE

* - are parameters which are presently included in
the current Great Lakes Data Storage System.